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Registration Decision

Carboquat 250T

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Registration Decision for Carboquat 250T

Health Canada's Pest Management Regulatory Agency (PMRA), under the authority of the *Pest Control Products Act*[1] and in accordance with the Pest Control Products Regulations, is granting full registration for the sale and use of active ingredient Carboquat 250T and the end-use product Carboquat WP-50 as a heavy duty wood preservative for wood destined for non-industrial above-ground and ground contact uses.

Current scientific data from the applicant and scientific reports were evaluated to determine if, under the proposed conditions of use, the product has value and does not present an unacceptable risk to human health or the environment.

These products were first proposed for registration in the Consultation Document[2]: Proposed Registration Decision—*Carboquat 250T* (PRD2007-06). This Registration Decision[3] describes this stage of the PMRA's regulatory process for Carboquat 250T as well as summarizes the Agency's decision and the reasons for it. The PMRA received no comments on PRD2007-06 that would impact the risk assessment. This decision is consistent with the proposed registration decision stated in PRD2007-06.

For more details on the information presented in this Registration Decision, please refer to PRD2007-06, which contains a detailed evaluation of the information submitted in support of this registration.

What Does Health Canada Consider When Making a Registration Decision?

The key objective of the *Pest Control Products Act* is to prevent unacceptable risks to people and the environment from the use of pest control products. Health or environmental risk is considered acceptable if there is reasonable certainty that no harm to human health, future generations or the environment will result from use or exposure to the product under its conditions of registration[4]. The Act also requires that products have value[5] when used according to the label directions. Conditions of registration may include special precautionary measures on the product label to further reduce risk.

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1 As per subsection 28(1) of the *Pest Control Products Act*.

2 "Consultation statement" as required by subsection 28(2) of the *Pest Control Products Act*.

3 "Decision statement" as required by subsection 28(5) of the *Pest Control Products Act*.

4 "Acceptable risks" as defined by subsection 2(2) of the *Pest Control Products Act*.

5 "Value" as defined by subsection 2(1) of the *Pest Control Products Act* "...the product's actual or potential contribution to pest management, taking into account its conditions or proposed conditions of registration, and includes the product's (a) efficacy; (b) effect on host organisms in connection with which it is intended to be used; and (c) health, safety and environmental benefits and social and economic impact".

To reach its decisions, the PMRA applies modern, rigorous risk-assessment methods and policies. These methods consider the unique characteristics of sensitive subpopulations in humans (e.g. children) as well as organisms in the environment (e.g. those most sensitive to environmental contaminants). These methods and policies also consider the nature of the effects observed and the uncertainties present when predicting the impact of pesticides. For more information on how the PMRA regulates pesticides, the assessment process and risk-reduction programs, please visit the PMRA's website at www.pmra-arla.gc.ca.

What Is Carboquat 250T?

Carboquat 250T is a broad-spectrum biocide with a carbon-based chemistry. It is to be mixed with a registered copper-based biocide to create a wood preservative. Wood is pressure treated with this preservative to control fungal decay and prolong the service life of the wood. The wood products treated with the Carboquat 250T-copper mixture are intended for residential applications that are not in contact with water.

Health Considerations

Can Approved Uses of Carboquat 250T Affect Human Health?

Carboquat 250T is unlikely to affect your health when used according to the label directions.

People could be exposed to Carboquat 250T when handling and applying the product, and also if contact is made with treated wood surfaces. When assessing health risks, the PMRA considers two key factors: the levels where no health effects occur and the levels to which people may be exposed. The dose levels used to assess risks are established to protect the most sensitive human population (e.g. children and nursing mothers). Only the uses for which the exposure is well below levels that cause no effects in animal testing are considered acceptable for registration.

Toxicology studies in laboratory animals describe potential health effects from varying levels of exposure to a chemical and identify the dose at which no effects are observed. The health effects noted in animals occur at doses more than 100-times higher than levels to which humans are normally exposed when products containing Carboquat 250T are used according to the label directions.

Both Carboquat 250T and Carboquat WP-50 are of high toxicity when given as a single oral dose to rats and are extremely irritating to the skin of rabbits. Consequently, the statements "Danger—Poison" and "Corrosive to Eyes and Skin" are required on the product labels.

When assessing the toxicity of Carboquat 250T in animals receiving daily doses over longer periods of time, the PMRA considered it appropriate to use animal studies performed with another structurally related chemical (didecyl didemethyl ammonium chloride; DDAC). The health effects following exposure to DDAC are considered to be representative of Carboquat 250T.

DDAC did not cause cancer in animals and was not genotoxic[6]. There was also no indication that DDAC would cause damage to the nervous system or adversely affect reproduction. The first signs of toxicity in animals given daily doses of DDAC over longer periods of time were clinical signs of toxicity in the animals, most likely a result of the irritating properties of the chemical, and subsequent decreases in body weight. The risk assessment protects against these effects by ensuring that the level of human exposure is well below the lowest dose at which these effects occurred in animal tests.

When DDAC was given to pregnant animals, effects on the developing fetus were only observed at doses that were higher than that which cause adverse effects in the mother. This indicates that the fetus is not more sensitive to DDAC than the adult animal. Consequently, no extra protective measures were applied during the Carboquat 250T risk assessment.

Risks in Residential and Other Non-Occupational Environments

Estimated risk for non-occupational exposure is not of concern provided that directions specified on the label are observed.

A risk assessment conducted for individuals contacting structures constructed with treated wood indicated that risk for adults and children is not of concern when the product is used according to the label directions.

Occupational Risks From Handling Carboquat WP-50

Occupational risks are not of concern when Carboquat WP-50 is used according to the proposed label directions, which include protective measures.

Workers mixing, loading or applying Carboquat WP-50 as well as workers handling freshly treated wood can come in direct contact with Carboquat 250T on the skin or through inhalation of spray mists. Therefore, the label will specify that anyone mixing or loading Carboquat WP-50 or exposed to the treatment solution or freshly treated wood must wear face protection, chemical-resistant coveralls over a long-sleeved shirt and long pants, chemical-resistant gloves, chemical-resistant footwear and respiratory protection.

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6 Genotoxic chemicals are those capable of causing damage to DNA. Such damage can potentially lead to the formation of a malignant tumor, but DNA damage does not lead inevitably to the creation of cancerous cells.

Based on these label requirements, risk to workers pressure treating wood is not a concern.

For bystanders, exposure is expected to be much less than that of workers and is considered negligible. Therefore, health risks to bystanders are not of concern.

Environmental Considerations

What Happens When Carboquat 250T Is Introduced Into the Environment?

Carboquat 250T is unlikely to affect the environment when used according to the label directions.

Carboquat 250T is persistent in soil and water/sediment systems. It is stable to hydrolysis, phototransformation and biotransformation and does not form any major transformation products in the environment. It strongly binds to soils; therefore, it has a low potential to leach into groundwater and contaminate it.

As Carboquat 250T partitions into sediment, binds strongly and is persistent, it has a high potential to pose a risk to sediment dwelling organisms. If surface runoff water from stacked treated wood in open lumber yards and effluents from treatment plants enter into aquatic systems, Carboquat 250T will pose a risk to aquatic organisms. Risk is mitigated by precautionary label statements limiting exposure of Carboquat 250T to aquatic systems. As well, wood treated with this product is not to be used in water.

Value Considerations

What Is the Value of Carboquat 250T and the End-Use Product Carboquat WP-50?

Carboquat WP-50 is a heavy duty wood preservative component that is to be mixed with one of two copper ethanolamine end products (NW 100-C or ACQ C2-EU) for the pressure treatment of wood intended for above ground and ground contact uses.

Carboquat WP-50, when tank-mixed in a 1:2 ratio with either NW 100-C or ACQ C2-EU and used to treat wood in a pressure cylinder, provides an effective protection against decay fungi and augments the service life of the wood. Wood treated with this preservative combination is intended for non-industrial uses where the treated wood will be above-ground and in contact with the ground. Carboquat WP-50 combined with either NW 100-C or ACQ C2-EU forms a preservative very similar to the currently registered ACQ-type wood preservatives. The main difference between this preservative and the currently registered preservatives is that it is expected to result in a less corrosive treating solution, which is less damaging to the metal cylinder and treating plant equipment.

Measures to Minimize Risk

Labels of registered pesticide products include specific instructions for use. Directions inclu risk-reduction measures to protect human and environmental health. These directions must b followed by law.

The key risk-reduction measures on the label of Carboquat 250T to address the potential risk identified in this assessment are as follows:

Key Risk-Reduction Measures

- **Human Health**

  Because there is a concern with users coming into direct contact with Carboquat 250 the skin or through inhalation of spray mists, anyone handling Carboquat WP-50 or freshly treated wood must wear face protection, chemical-resistant coveralls over long-sleeved shirt and long pants, chemical-resistant gloves, chemical-resistant footw and respiratory protection.

- **Environment**

  Limiting exposure of Carboquat 250T to aquatic systems through direct discharge or surface runoff from stored treated wood in lumber yards will minimize the risk to all aquatic organisms. As well, wood treated with this product is not to be used in water

Other Information

1. The relevant test data on which the decision is based (as referenced in this document available for public inspection, upon application, in the PMRA's Reading Room (loc in Ottawa). For more information, please contact the PMRA's Pest Management Information Service by phone (1-800-267-6315) or by e-mail (pmra_inforserv@hc-sc.gc.ca).

2. Any person may file a notice of objection[7] regarding this registration decision within 60 days from the date of publication of this Registration Decision document. For mo information regarding the basis for objecting (which must be based on scientific grou please refer to the PMRA's website (Requesting a Reconsideration of Decision, www.pmra-arla.gc.ca/english/pubreg/reconsideration-e.html) or contact the PMRA's Pest Management Information Service by phone (1-800-267-6315) or by e-mail (pmra_inforserv@hc-sc.gc.ca).

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[7] As per subsection 35(1) of the *Pest Control Products Act*.

References

A. LIST OF STUDIES/INFORMATION SUBMITTED BY REGISTRANT

1.0 Chemical Assessment

PMRA Document Number	Reference
935943	CHEMICAL AND PHYSICAL PROPERTIES. CARBOQUAT WP-50. (COLOUR, PHYSICAL STATE, ODOUR, FORMULATION TYPE, CONTAINER MATERIAL AN DESCRIPTION, DENSITY OR SPECIFIC GRAVITY, PH, OXIDIZING OR REDUCIN ACTION, VISCOSITY, STORAGE STABILITY DATA, FLAMMABILITY, EXPLODABILITY, MISCIBILITY, CORROSION CHARACTERISTICS, DIELECTRIC BREAKDOWN VOLTAGE.
1011749	Oxidizing/reducing action, Waiver Request. Dell Tech Laboratories Ltd. DACO: 3.5.8
1011750	Caroquat WP-50: Corrosion Characteristics, Waiver Request. Dell Tech Laboratories Ltd. DACO: 3.5.15
1011677	Determination of the Photolysis Rate of Didecyldimethylammoniumchloride (DDAC) in pl Buffered Solution at 25C. 1989. Report Number 37005. DACO: 8.2.3.3.2
1011678	Determination of the Photolysis Rate of Didecyldimethylammoniumchloride on the Surfac Soil. 1992. Report Number 39505. DACO: 8.2.3.3.1
1077369	Determination of Quat Composition in Carboquat 250T and Quantification of Carbonate a Bicarbonate. DACO: 2.13.2
1077370	Preliminary Analysis. 2005. Report Number 16888. DACO: 2.13.3
1077371	Storage Stability and Corrosion Characteristics. 2005. Report Number 15726. DACO: 2.14
1118456	EVALUATION OF THE CORROSION CHARACTERISTICS OF CARBOQUAT® 250 USING A LABORATORY IMMERSION CORROSION TEST. 2005. Report Number 33 DACO: 2.14.13
1118458	Accelerated Storage Stability Study. 2005. Report Number 17828. DACO: 2.14.13
1147753	Determination of Total Free Amine in Carboquat 250T, Batch # G4223431 by Titration Method. 2005. DACO: 2.13.1
1147757	Karl Fischer Determination of Water in DDA Carbonate/Bicarbonate. 2006. DACO: 2.13.1
1393814	Carbonate/Bicarbonate in Carboquat [analytical method]. 2006. DACO: 2.13.1
1393816	Carbonate Titration With Correction for Amine Rev1 [Batch Data]. 2006. DACO: 2.13.3
1393826	US Patent Application for IN SITU PROCESS FOR MAKING QUATERNARY AMMONIUM BICARBONATES AND QUATERNARY AMMONIUM CARBONATES 2004. DACO: 2.11.2

PMRA Document Number	Reference
1395099	Carboquat Product Chemistry - Recalculation of Study Results Rev 0. DACO: 2.13.3
1396370	Description of the Discussion of Formation of Impurities. DACO: 2.11.4
1396371	Establishing Certified Limits. DACO: 2.12.1
1396388	Sample(s) of Analytical Standards and ROC. DACO: 2.15
1396486	Chemistry Requirements for the Registration of a TGAI. DACO: 2.1,2.2,2.3.1,2.4,2.5,2.6,2.7,2.8,2.9
1396487	Manufacturing Summary. DACO: 2.11.1
1396488	Description of Starting Materials. , DACO: 2.11.2
1396490	Detailed Production Process Description,. DACO: 2.11.3
1396492	Amended Final Report Carboquat - Preliminary Analysis. 2003. Lonza Inc., Report Number SP-02049-A. DACO: 2.13.2
1396494	Chemical and Physical Properties: Carboquat 250T. DACO: 2.14.1,2.14.2,2.14.3,2.14.6
1396495	Carboquat - Physical and Chemical Properties. 2002. Lonza Inc., Report Number SP-02046-A. DACO: 2.14.1,2.14.2,2.14.3,2.14.6
1396497	Melting Point + Boiling Point + Water Solubility + Solvent Solubility + Vapour Pressure, waiver request + Dissociation Constant, waiver request + Octanol/Water Partition Coefficient, waiver request + UV Visible spectrum + Stability and Storage Stability.

2.0 Impact on Human and Animal Health

PMRA Document Number	Reference
728063	Comparison of Results for Studies Conducted with Didecyl Dimethyl Ammonium Carbonate and Didecyl Dimethyl Ammonium Chloride. DACO: 4.1
728064	Acute Oral Toxicity in Rats - Median Lethal Dosage Determination Using a 5% Active Ingredient Formulation of Didecyl Dimethyl Ammonium Carbonate. 1994. Report Number 93-8185-21. DACO: 4.2.1
728075	Primary Skin Irritation Study in Rabbits Using a 50% Active Ingredient Formulation of Didecyl Dimthyl Ammonium Carbonate. 1994. Report Number 93-8185-21. DACO: 4.2.5
728078	Photoallergy Study with Didecyl Dimethyl Ammonium Carbonate in Guinea Pigs. 1994. Report Number 93-8123-21. DACO: 4.2.6
930464	Waiver Request, DACO: 4.2.2
930466	Waiver Request, DACO: 4.2.3

PMRA Document Number	Reference
930468	Waiver Request, DACO: 4.2.4
1011676	Dermal Sensitization Test in Guinea Pigs. 2004. Report Number 15512. DACO: 4.2.6
1284326	21 Day Repeated Dose Dermal Irritation Study with Carboquat in Female Rats. 2006. Report Number 19072. DACO: 4.3.8
1214218	CHROMOSOMAL ABERRATIONS ASSAY WITH CHO CELLS IN VITRO. 1986. Report Number 4236. DACO: 4.5.4
1214219	SALMONELLA/MAMMALIAN - MICROSOME ASSAY WITH BARDAC 22. 1982. DACO: 4.5.4
1214220	ANALYSIS OF METAPHASE CHROMOSOMES OBTAINED FROM BONE MARROW OF RATS. 1987. Report Number LZA 24/8761. DACO: 4.5.4
1214221	TERATOLOGIC EVALUATION OF THREE QUATERNARY COMPOUNDS. 1977. Report Number 5155/2224A. DACO: 4.5.2
1226288	MUTAGENICITY TEST ON DDAC IN THE CHO/HGPRT FORWARD MUTATION ASSAY. 1988. Report Number 10141-0-435. DACO: 4.5.4
1226301	MUTAGENICITY TEST ON DDAC IN THE RAT PRIMARY HEPATOCUTE UNSCHEDULED DNA SYNTHESIS ASSAY. 1988. Report Number 10141-0-447. DACO: 4.5.4
1226312	NINETY-DAY DIETARY SUBCHRONIC ORAL TOXICITY STUDY WITH DDAC IN RATS. 1988. Report Number 51-506. DACO: 4.3.1
1226313	SUBCHRONIC DIETARY DOSE RANGE FINDING STUDY WITH DDAC IN MICE. 1988. Report Number 51-507. DACO: 4.3.1,4.3.8
1226314	NINETY-DAY SUBCHRONIC DERMAL TOXICITY STUDY WITH DDAC IN RATS. 1988. Report Number 51-554. DACO: 4.3.4
1226315	DEVELOPMENTAL TOXICITY STUDY OF DDAC ADMINISTERED BY GAVAGE TO NEW ZEALAND WHITE RABBITS. 1989. Report Number 51-590. DACO: 4.5.2
1236492	TWO-GENERATION REPRODUCTION STUDY IN SPRAGUE-DAWLEY (CD) RATS WITH DIDECYLDIMETHYLAMMONIUMCHLORIDE ADMINISTERED IN THE DIET. 1991. Report Number 52-648. DACO: 4.5.1
1236493	CHRONIC DIETARY ONCOGENICITY STUDY WITH DIDECYLDIMETHYLAMMONIUMCHLORIDE IN MICE. 1991. Report Number 53-528. DACO: 4.4.1,4.4.2
1236494	ADDENDUM TO REPORT ENTITLED "ABSORPTION, DISTRIBUTION, METABOLISM AND EXCRETION STUDIES OF DIDECYLDIMETHYLAMMONIUMCHLORIDE (DDAC) IN THE RAT. 1989. Addendum to Report Number P01421. DACO: 4.5.9,6.4
1236495	ABSORPTION, DISTRIBUTION, METABOLISM AND EXCRETION STUDIES OF DIDECYLDIMETHYLAMMONIUMCHLORIDE (DDAC) IN THE RAT. 1989. Report Number P01421. DACO: 4.5.9,6.4

PMRA Document Number	Reference
1239055	CHRONIC ORAL TOXICITY STUDY OF DIDECYLDIMETHYLAMMONUIM CHLORIDE IN DOGS. 1991. Report Number 2545-102. DACO: 4.3.1
1239056	CHRONIC DIETARY TOXICITY/ONCOGENICITY STUDY WITH DIDECYLDIMETHYLAMMONIUMCHLORIDE IN RATS. 1991. Report Number 53-566. DACO: 4.4.1,4.4.2
1239057	CHRONIC DIETARY TOXICITY/ONCOGENICITY STUDY WITH DIDECYLDIMETHYLAMMONIUMCHLORIDE IN RATS. 1991. Report Number 53-566. DACO: 4.4.1,4.4.2
1239058	DEVELOPMENTAL TOXICITY EVALUATION OF DIDECYLDIMETHYLAMMONIUMCHLORIDE ADMINISTERED BU GAVAGE TO CD (SPRAGUE-DAWLEY) RATS. 1991. Report Number 53-534. DACO: 4.5.2
1141185	Determination of Dislodgeable Carboquat Residues from Sapwood Boards Pressure Treated with an Ammoniacal Copper Quat (ACQ) Formulation - Part I. 2006. Report Number 2005-CT-ACQ-PS. DACO: 5.9
1141186	Determination of Dislodgeable Carboquat Residues from Sapwood Boards Pressure Treated with an Ammoniacal Copper Quat (ACQ) Formulation - Part II. 2006. Report Number 2005-CT-ACQ-PS. DACO: 5.9
1284320	Determination of Dislodgeable Carboquat Residues From Heartwood Boards Pressure Treated with ACQ Formulation. 2006. DACO: 5.9

3.0 Impact on the Environment

PMRA Document Number	Reference
728095	Determination of the Leachability of Bardac 22C from Treated Wood. 2001. Report Number 2000-CT-WL-B22C. DACO: 8.6
930888	Executive Summary of 8.6 (Determination of the Leachability of Bardac 22C from Treated Wood., Report Number 2000-CT-WL-B22C. DACO: 8.1
1011673	Incineration Waiver Request, Dell Tech Laboratories, DACO: 8.5.2
1011677	Determination of the Photolysis Rate of Didecyldimethylammoniumchloride (DDAC) in pH 7 Buffered Solution at 25C. 1989. Report Number 37005. DACO: 8.2.3.3.2
1011678	Determination of the Photolysis Rate of Didecyldimethylammoniumchloride on the Surface of Soil. 1992. Report Number 39505. DACO: 8.2.3.3.1
1011679	Hydrolysis of Didecyldimethylammoniumchloride (DDAC) as a Function of pH at 25°C. 1989. Report Number 37004. DACO: 8.2.3.2
1011680	Aerobic Soil Metabolism of ^{14}C-Didecyldimethylammoniumchloride (^{14}C-DDAC). 1991. Report Number 37006. DACO: 8.2.3.4.2
1011681	Aerobic Aquatic Metabolism of ^{14}C-Didecyldimethylammoniumchloride (^{14}C-DDAC). 1991. Report Number 37008. DACO: 8.2.3.5.2

PMRA Document Number	Reference
1011682	Anaerobic Aquatic Metabolism of ^{14}C-Didecyldimethylammoniumchloride (^{14}C-DDAC). 1991. Report Number 37007, DACO: 8.2.3.5.6
1011683	Soil/Sediment Adsorption-Desorption of ^{14}C-Didecyldimethylammoniumchloride (DDAC). 1989. Report Number 37009. DACO: 8.2.4
1345651	Environmental Monitoring for Didecyldimethylammoniumcarbonate/bicarbonate (Carboquat) Residues in Water, Sediment, and Soil from Aquatic Systems Containing Piers/Docks Constructed from Wood Pressure-Treated with Carbquat WP-50. 2006. Vol I of II, Report Number TCI-04-107.
1345652	Environmental Monitoring for Didecyldimethylammoniumcarbonate/bicarbonate (Carboquat) Residues in Water, Sediment, and Soil from Aquatic Systems Containing Piers/Docks Constructed from Wood Pressure-Treated with Carbquat WP-50. 2006. Vol II of II, Report Number TCI-04-107.
1345653	Validation of the Residue Analytical Method: Determination of Carboquat (N,N-Didecyl-N,N-dimethylammonium Carbonate/Bicarbonate; CAS RN 148788-55-0 and CAS RN 148812-65-1) in Biota (Fish Tissue). 2006. Report Number ML05-1277-LON. DACO: 8.2.2
728096	Risk Assessment for the Fresh Water Aquatic Wood Preservation Wood Pattern for Didecyl Dimethyl Ammonium Carbonate. 2002. DACO: 9.1
728098	Intermittent flow through reproduction test with didecyldimethylammonium chloride and Daphnia magna. 2001. Report Number 99-9048-04. DACO: 9.3.2
728101	Didecyl Dimethyl Ammonium Carbonate: An Acute Oral Toxicity Study with the Northern Bobwhite. 1994. Report Number 289-112. DACO: 9.6.2.1
728103	Didecyl Dimethyl Ammonium Carbonate: A Dietary LC50 Study with the Northern Bobwhite. 1994. Report Number 289-110A. DACO: 9.6.2.4
728105	Didecyl Dimethyl Ammonium Carbonate: A Dietary LC50 Study with the Mallard. 1994. Report Number 289-111. DACO: 9.6.2.5
1011674	A Flow-Through Life-Cycle Toxicity Study of Bardac 22C50 with the Caldoceran (Daphnia magna). 2004. Report Number 289A-162. DACO: 9.3.3
1011684	Salinity Challenge Waiver Request, Dell Tech Laboratories, Ltd., DACO: 9.5.2.4.1
1011685	An Early Life-Stage Toxicity Test of Bardac 22C50 with the Fathead Minnow (Pimephales promelas). 2004. Report Number 289A-155. DACO: 9.5.3.1
1011686	Bioconcentration and Elimination of 14 C- Residues by Bluegill (Lepomis macrochirus) Exposed to Didecyldimethylammonium Chloride (DDAC). 1990. Report Number 89-7-3043. DACO: 9.5.6
1011688	A 96-Hour Toxicity Test of Bardac 22C50 With the Freshwater Diatom (Navicula pelliculosa). 2004. Report Number 289A-160. DACO: 9.8.2
1011689	A 96-Hour Toxicity Test of Bardac 22C50 With the Freshwater Alga (Anabaena flos-aquae). 2004. Report Number 289A-158. DACO: 9.8.2

PMRA Document Number	Reference
1011690	A 96-Hour Toxiciety Test with the Freshwater Alga (Selenastrum capricornutum). 2002. Report Number 289A-152. DACO: 9.8.2
1011691	Alga, Growth Inhibition Test (72 [h]). 1998. Project Number 981001CL, Report Number 3011. DACO: 9.8.2
1011692	A 96-Hour Toxicity Test of Bardac 22C50 with Marine Diatom (Skeletonema costatum). 2004. Report Number 289A-161. DACO: 9.8.3
1011693	A 7-Day Toxicity Test of Bardac 22C50 with Duckweed (Lemna gibba G3). 2004. Report Number 289A-159. DACO: 9.8.5
1011823	A 96 Hour Toxicity test with the freshwater Algae (Selenastrum capricornutum) Using Natural Surface Water. 2003. Report Number 289A-153. DACO: 9.8.2

4.0 Value

PMRA Document Number	Reference
1011753	Efficacy of ACQ Wood Preservatives Formulated with Didecyl Dimethyl Ammonium Carbonate/Bicarbonate (Carboquat WP-50), DACO: 10.2.3.2
1011754	Fixation Mechanism for ACQ in Treated Wood; Deficiency Response Data., DACO: 10.2.1
1079436	Lonzagroup Technical Service Report. 2005. Report Number CS-05-006. DACO: 10.3
1094081	Evaluation of Copper Leachability in Southern Pine and Amabilis Fir Treated with NW 100. 2004. Project Number 3018. DACO: 8.3.4
1094082	Initiation of Ground Contact Field Test of Stakes Treated with ACQ-D (Carbonate). 2005. Project Number 4464. DACO: 10.2.3.4
1178174	DDA with Various Anions. Deficiency Response. 2003. DACO: 10.2.1,10.2.3.2,10.2.3.3
1178177	Proposal to P4 regarding re-wording, clarification, and standardization of the format of the definitions of ACQ Type C and ACQ Type D in AWPA Standard P5, and re-insertion of ACQ Type A into Standard P5. 2003. DACO: 10.6
1348666	Two-year inspection of an above-ground field test of lumber treated with ACQ-D(Carbonate). 2006. Project No. 5534. DACO: 10.2.3
1348667	One-year inspection of a ground contact field test of stakes treated with ACQ-D(Carbonate). 2006. Project No. 5501. DACO: 10.2.3
1345080	Two Year inspection of an above ground field test of lumber treated with ACQ -D (carbonate). 2006. Project Number 5534. DACO: 10.2.3.4
1346774	An Evaluation of the Efficacy of ACQ Type D In Canadian Wood Species Using the AWPA Standard E10 Soil Block Procedure. 2006. Report Number AQ P144. DACO: 10.2.3.2(G)

PMRA Document Number	Reference
1346775	An Evaluation of the Efficacy of ACQ Type D In Canadian Wood Species Using the AWPA Standard E10 Soil Block Procedure - Methodology. 2006. Report Number AQ P144. DACO: 10.2.3.2(G)
1346777	An Evaluation of the Efficacy of ACQ Type D In Canadian Wood Species Using the AWPA Standard E10 Soil Block Procedure. 2006. Report Number AQ P144. DACO: 10.2.3.2(G)